

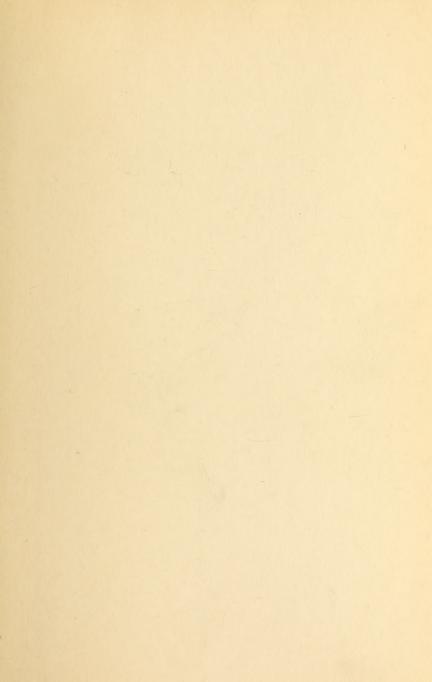
HOW THE MIND VILS INTO ERROR

HUNRY BRACFORD SMITH

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How THE MIND FALLS INTO ERROR

A BRIEF TREATMENT OF FALLACIES FOR THE GENERAL READER

BY

HENRY BRADFORD SMITH

UNIVERSITY OF PENNSYLVANIA



186094.

HARPER & BROTHERS, PUBLISHERS
NEW YORK AND LONDON
MCMXXIII

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First Edition

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PREFATORY NOTE

Nothing has a higher value in the eyes of the mere teacher attempting to present some subject dry and forbidding in itself, than a fresh illustration; and a teacher of logic is no exception to the rule. Every student in this field who has suffered at the hands of preceptors is familiar with that ancient argument: "What you bought yesterday, you eat to-day; you bought raw meat yesterday; therefore, you eat raw meat to-day." A wellknown writer observes of this case: "This piece of meat has remained uncooked, as fresh as ever, a prodigious time. It was raw when Reisch mentioned it in the Margarita Philosophica in 1496: and Doctor Whateley found it in just the same state in 1826." Fresh illustration is as much of a necessity for teacher or student in this field as in any other and it is this need for which the present essay hopes in some sort to provide. The writer, encouraged by certain favorable attention which the chapter on fallacies in his First Book in Logic has aroused, has tried to give that material through expansion and amplification a somewhat wider appeal.

H. B. S.





CHAPTER I

PARADOX AND ITS REDUCTION

LOGIC, it is generally supposed, is a term that is employed to designate a definite body of doctrine. But such is by no means the case. There are many differing views as to what logic is presumed to deal with, differing ideas as to the nature of the problems, which logic is supposed to solve. To understand this divergence of view as to what constitutes the proper domain of the science, it would be essential to have some acquaintance with the general history of ideas. The work of Mill, for example, was a culmination of the English tradition which begins with Bacon; and the "New Organon," a supposed emancipation from the "Organon" of Aristotle, was taken to set up a new instrument of investigation which would make unnecessary the use of Aristotle's own. It is largely because of this Baconian tradition that the study of formal logic has fallen into disrepute.

It is sometimes amazing to mark the effect of an intellectual tradition in the demolition of alien points of view. When the Lockian philosophy was imported into France and supported by the authority of Voltaire's name, the rationalistic tradition, already weakened, was swept away. In the seventeenth century it dominated the thought of continental Europe. The empirical tradition as it has established itself in England and America, together with effects that cannot be too highly valued, has carried in its wake a certain blight. The study of formal logic, never quite at home on such soil, maintains itself with difficulty. De Morgan says: "We live in an age in which formal logic has long been nearly banished from education: entirely, we may say, from the education of the habits." What we propose in this essay is a classification of the fallacies of the reason, following in the main, but not strictly, the classical tradition; and we shall illustrate each heading or division of the subject by illustrations drawn from the sciences and from belles-lettres.

FALLACY, SOPHISM AND PARADOX

Fallacy is a word that is used in a restricted sense to designate an offense against some one of the principles of correct inference; but it is loosely employed as well to denote any one of the ways

by which men come to adopt erroneous opinions. A fallacy may be termed a sophism, a paradox or a paralogism whenever we have in mind the result, rather than the false method by which the result is gained. Thus, any view which runs counter to our common apprehension of things, or which seems to offend our common sense, is said to be paradoxical. We may call an opponent's argument sophistical, whenever it has placed us in some awkward position from which we find no rational escape. The German philosopher Kant employs the term paralogism to designate a particular error which the mind shows a special tendency to adopt.

What is simple and self-evident to a man of one viewpoint may appear paradoxical to another whose viewpoint is different. The following anecdote concerning Agassiz might easily pass for a case in point for the merchant or for the financier. The directors of a lyceum lecture course had endeavored to include one of the popular addresses of the famous naturalist, but their offer was rejected. "We will give you double your price," they said, "if you will accommodate us." "Ah, sirs," he returned, "I should be glad to help you, but I cannot afford to waste time in making money." Having no sense of the paradox, Agassiz could never understand why this remark enjoyed such popularity.

3

AN OPINION IN THE TEETH OF GENERAL FAME

The man whose logical faculty is not stirred by paradox and by the subsequent reduction of paradox to the plain status of intelligible fact, must possess an intellect that is indeed soft and unadventurous. The following passage from De Quincey will yield us a further example. He says:

"One fact, which struck me by accident, and not until after a long familiarity with Kant's writings, is this, that in all probability Kant never read a book in his life. This is paradoxical, and undoubtedly in the very teeth of general fame, which represents him to have been a prodigious student in all parts of knowledge, and therefore, of necessity it may be thought, a vast reader."

Having stated the case thus boldly, this writer now prunes away the implications that mislead, and softens the hard note of logical discord with reconciling distinctions:

"What! none? No, none at all; no book whatsoever. The books of which he read most were,
perhaps, books of voyages and travels; for he himself gave lectures on what he called Physical
Geography. . . . But whenever the business of
the writer was not chiefly with facts, but with speculations built on facts, Kant's power of thought gave
him a ready means of evading the labor of reading
the book. Taking the elemental principles of the

writer as stated by himself or another . . . he would then *integrate* these principles for himself. . . . In this way he judged of Plato, Berkeley, and many others. . . . Yet these were writers in his own department; and if he would not read *them*, it may be presumed that . . . he would read nobody."

THE SOPHISM OF BOSSUET

The author of a sophism is commonly held to be convicted not only of a breach of the rules of correct thinking, but consciously convicted. In this sense Socrates defined a sophist, not as a wise man (the original connotation of the term), but as one who makes the worse appear the better reason. The term may thus be applied by one's opponent to any logical dilemma in which he discovers himself and from which he finds no rational escape.

In illustration of the manner in which a sophism may lurk among current opinions we may cite the following instance. Even the great Kant, whose dialectical powers will hardly be questioned, precipitately placed upon this argument the stamp of his approval. It is this: If the Roman Church, as they say, admits no possibility of salvation except within its own pale, and the Protestant admits that the Romanist has still a chance of salvation, then, as Bossuet remarks, a wise man will make a safer choice by indorsing the Catholic faith.

This argument is older than Bossuet and was answered by the Protestants again and again. Besides the slight value in the eyes of God of a faith based on mere expediency, other still more convincing considerations might be urged. Coleridge remarks of this case: "The Protestant does not say that a man can be saved who chooses the Catholic religion, not as true, but as the safest; for this is no religion at all, but only a pretense to it." Jeremy Taylor, in a letter to a lady who had been converted to Catholicism, observes:

"I wish that you would consider that, if any of our men say salvation may be had in your church . . . it is only because you do keep so much of that which is our religion, that upon the confidence of that we hope well concerning you. And we do not hope anything at all that is good of you or your religion, as it distinguishes from us and ours: we hope that the good which you have in common with us may obtain pardon, directly or indirectly, or may be an antidote of the venom, and an amulet of the danger, of your very great errors. So that, if you derive any confidence from our concession, you must remember where it takes root; not upon anything of yours, but wholly upon the excellence of ours." Moreover, "whatever we talk, things are as they are, not as we dispute," and it would be small consolation to the lady, becoming ultimately aware of her mistake, that the Protestants in

charity and in tolerance of opinion had conceded her a chance of the salvation of which a sophism too precipitately endorsed had deprived her.

A LITTLE LOGIC IS A DANGEROUS THING

Doctor Johnson said of a man, who had cleverly maintained that the difference between virtue and vice is illusory: "When he leaves our house, let us count our spoons." During a discussion regarding the existence of God, Voltaire put the servants out of the room, with the remark: "I do not care to have my throat cut in the night"—the difference between a little logic and none at all, operating in the domain of morals, being measured by the difference between theft and murder, if we accept the estimates of these two authorities. "A little skill in antiquity inclines a man to Popery," says another writer. "But depth in that study brings him about again to our religion."

An intellect which has developed neither the habit nor the power of logical distinction, will be prone to subscribe to any half truth that is speciously expressed. A man is declared to possess no talent because he does not write well; whereas, his talents, it may be presumed, are contained in his original nature, while his ability to give expression to his thought may depend on the circumstances of his training. Who shall say how much

original genius has failed on this account! Even untruths, and untruths that are only plausible because of failure to review the most ordinary scientific facts, found themselves upon this weakness of the logical faculty. It was recently urged by a correspondent to a daily paper that the daylightsaving law (by which the clocks are set forward an hour at a specified time of the year) has a tendency to weaken the respect for truth in the minds of the young, as if the time of day were some unalterable fact revealed to man on tables of stone. In truth, exactly the opposite tendency might be urged by the informed or intelligent opponents of this view; for the lesson is taught that certain things are only true by agreement, and taught in such a manner that no single member of the state may evade that knowledge, that there is a difference between natural fact, that resists any whim of man that it be otherwise, and human conventions that are altered at will.

"A little learning is a dangerous thing; Drink deep, or taste not the Pierian spring; There shallow draughts intoxicate the brain, And drinking largely sobers us again."

COMMON MEASURES FOR SOLVING PARADOX

The commonest means employed by the logician in the solution of a paradox is that of extending

the meaning of the terms that enter into the statement of the difficulty or by the introduction of some clarifying distinction. Many illustrations of this procedure, were they not too technical for our present purposes, might be drawn from the history of the sciences. No experience is more familiar to the mathematician than the need of extending the meaning of his indefinables—that is, the terms or relationships of which he treats—in order to account for limiting cases, whose crucial character was not suspected, when his original definitions were set down. Thus, one of the characteristic obstacles which the student of algebra has to overcome, is the meaning which he is called upon to attach to imaginary quantity. The primitive meaning of quantity, the only one with which he is familiar, will not suffice for the purpose in hand. Instinctively he holds to the original meaning of the term, while striving to grasp the new. The older logicians encountered many paralogisms because they were unable to generalize their conceptions and redefine their terms. In this connection a simple illustration may be given. One would like to be able to say of any two classes, that their logical product is also a class. But this will compel the introduction into the science of the notion of a class that has no members, and such a class has paradoxical properties. Again, the idea of a proposition that is never true, is one with which

the older logicians could not deal, although it is common in popular usage and recognized by common sense:

"I will not be afraid of death and bane Till Birnam forest come to Dunsinane,"

means: I will not be afraid till an impossibility becomes possible; that is, without qualification, I will not be afraid. Again:

"Nay, had I power, I should Pour the sweet milk of concord into hell, Uproar the universal peace, confound All unity on earth,"

which means: if what follows is false, then what implies it is false, for an implication that is asserted, is true by supposition. The use of the conditional renders the meaning unambiguously.

A popular illustration of the reduction of paradox to the status of intelligible fact is contained in the following anecdote: The story is told of a well-known teacher that he on one occasion received a visit on the part of the parent of a student whom he had refused to pass in his course. "Sir," he said, addressing his visitor, "your son's work was both good and original. But"—and he proceeded to reduce the paradox, for this man was known to dote on logical distinctions—"the original work was not good, was, in effect, bad; whereas,

the remainder, though otherwise good, was not original. As the case stood, therefore, it was out of the question to pass him." Daniel Webster in one of his speeches once made a similar distinction: "I have read their platform; but I see nothing in it both new and valuable. What is valuable is not new and what is new is not valuable."

The following examples, which further illustrate the meaning of paradox, are taken from the writings of De Quincey and, since they cannot be better related, we shall quote this author in full:

"A great philosopher pronounces the people of Crete, one and all, liars. But this great philosopher, whose name is Epimenides, happens himself to be a Cretan. On his own showing, therefore, Epimenides is a liar. But if so, what he says is a lie. Now, what he says is, that the Cretans are liars. This, therefore, as coming from a liar, is a lie; and the Cretans as is now philosophically demonstrated, are all persons of honor and veracity. Consequently, Epimenides is such. You may depend on everything he says. But what he says most frequently is, that all the Cretans are liars. Himself, therefore, as one amongst them, he denounces as a liar. Being such, he has falsely taxed the Cretans with falsehood, and himself amongst them. It is false, therefore, that Epimenides is a liar. Consequently, in calling himself

by implication a liar, as one amongst the Cretans, he lied. And the proof of his veracity rests in his having lied. And so on da capo for ever and ever.

"A more pleasant example of the same logical see-saw occurs in the sermons of Jeremy Taylor. That man, says the inimitable bishop, was prettily and fantastically troubled, who, having used to put his trust in dreams, one night dreamed that all dreams were vain; for he considered, if so, then this was vain, and the dreams might be true for all this. (For who pronounced them not true except a vain dream?) But if they might be true then this dream might be so upon equal reason. And dreams were vain, because this dream, which told him so, was true; and so round again. In the same circle runs the heart of man. All his cogitations are vain, and yet he makes especial use of this—that that thought which thinks so, that is vain. And if that be vain, then his other thoughts, which are vainly declared so, may be real and relied upon. You see, reader, the horrid American fix into which a man is betrayed, if he obeys the command of a dream to distrust dreams universally, for then he has no right to trust in this particular dream, which authorizes his general distrust. No; let us have fair play. What is sauce for the goose is sauce for the gander. And this ugly gander of a dream, that notes and protests all dreams col-

lectively, silently and by inevitable consequence notes and protests itself.

"So natural, indeed, to the morbid activity of man are these revolving forms of alternate repulsion, where flight turns suddenly into pursuit, and pursuit into flight, that I myself, when a schoolboy, invented several: this, for instance, which once puzzled a man in a wig, and I believe he bore me malice to his dying day, because he gave up the ghost by reason of fever, before he was able to find out satisfactorily what screw was loose in my logical conundrum; and thus, in fact, 'all along of me' (as he expressed it) the poor man was forced to walk out of life re infecta, his business unfinished, the one sole problem that had tortured him being unsolved. It was this. Somebody had told me of a dealer in gin, who, having had his attention roused to the enormous waste of liquor caused by the unsteady hands of drunkards, invented a counter which, through a simple set of contrivances, gathered into a common reservoir all the spillings that previously had run to waste. St. Monday, as it was then called in English manufacturing towns, formed the jubilee day in each week for the drunkards; and it was now ascertained (i.e. subsequently to the epoch of the artificial counter) that oftentimes the mere 'spilth' of St. Monday supplied the entire demand of Tuesday. It struck me, therefore, on reviewing this case, that

the more the people drank, the more they would titubate, by which word it was that I expressed the reeling and stumbling of intoxication. If they drank abominably, then of course they would titubate abominably; and, titubating abominably, inevitably they would spill in the same ratio. The more they drank, the more they would titubate; the more they titubated, the more they would spill; and the more they spilt, the more, it is clear, they did not drink. You can't tax a man with drinking what he spills. It is evident, from Euclid, that the more they spilt, the less they could have to drink. So that, if their titubation was excessive, then their spilling must have been excessive, and in that case they must have practiced almost total abstinence. Spilling nearly all, how could they have left themselves anything worth speaking of to drink? Yet, again, if they drank nothing worth speaking of, how could they titubate? Clearly they could not; and, not titubating, they could have had no reason for spilling, in which case they must have drunk the whole—that is, they must have drunk to the whole excess imputed, which doing, they were dead drunk, and must have titubated to extremity, which doing, they must have spilt nearly the whole. Spilling the whole, they could not have been drunk. Ergo, could not have titubated. Ergo, could not have spilt. Ergo, must have drunk the whole. Ergo, were dead drunk. Ergo,

must have titubated. And so round again, as my Lord the bishop pleasantly expresses it, in secula seculorum."

GUTHRIE ON THE INSOLUBILIA

Professor Guthrie says in his work on the Paradoxes of Mr. Russell: "Rüstow has collected a large number of references to similar paradoxes in ancient writings, notably in the works of Plato, Aristotle, and Diogenes Laertius. Among these ancient writers the paradox of the liar was the one to attract the most attention. As a rule the paradox was accepted as final, and the fact that it existed was used in support of an attack on the validity of human knowledge, as Montaigne used it later on. What solutions were proposed were crude attempts to place it under one of the Aristotelian forms of fallacy. No analysis of the paradoxes was made, nor were they recognized as a class. It was not until the time of the Scholastic logicians that they were presented in a form which offers interesting parallels to our present statement and analysis. During the Scholastic period the interest which the Paradoxes or Insolubilia aroused was so great that many of the text-books of logic written from the fourteenth to the sixteenth centuries devoted lengthy chapters to them and there were a number of separate treatises in which their solution was attempted.

"Anything like a careful analysis of the Scholastic doctrines concerning the Insolubilia would require an extensive knowledge of medieval logic and might not be justified in a study of the logical side of the problem. But it is of some interest to see the form in which the difficulties arose and the types of solution offered, and in particular the close analogies which these bear to the solutions of more modern writers." One method of dealing with the problem (pars propositionis non potest supponere pro toto) "appealed to a number of later writers, Johannis Majoris Scotus, Olkot, and Rosetus among them. It is much the same as Russell's device of the theory of types which depends on the principle of the vicious circle, namely, that no term in a proposition can presuppose the proposition or have it as one of its possible values. The only Scholastic to make a serious criticism of this view was Wycliffe and the difficulty which he points out is much the same as that contained in the theory of types. If we are not to allow a proposition to refer to itself we make a general proposition like "All propositions are true or false" exceptive. It becomes "All propositions are true or false except this proposition." We would seem to do away with all general propositions about propositions and there are some of these which we do not wish to reject. . . . Wycliffe's theory is really of the type of another theory termed by an

unknown author of a Paris manuscript cassatio, which involved denying that the propositions in question were propositions at all." Professor Guthrie at the end of his work offers a solution of the difficulty, which, however, is of too advanced a character to be given here.

CHAPTER II

EQUIVOCATION AND AMPHIBOLOGY

PALLACIES most frequently hinge upon an ambiguity in the meaning of a term or proposition. Those of the first sort are called fallacies of equivocation; those of the second sort amphibology. The first expression may, however, be employed in a more general sense so as to include both cases.

AMBIGUITIES OF COMMON WORDS

Let us consider in the first instance the ambiguities which certain very common words take on, such as the adjectives of quantity all, some, and no, the definite article, and the copula. To assert that "all the angles of a triangle equal two right angles" and "all the angles of a triangle are less than two right angles" is in each case to say something true, if all is regarded collectively in the first example and distributively in the second. In the two expressions, "all of these twelve men are a jury" and "all of these men are opinionated," the same ambiguity is apparent. In the Social Con-

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tract of Rousseau a man is said to surrender all his rights that the rights of all may be preserved:

"Chacun se donnant à tous ne se donne à personne."

In this manner of phrasing the distinction the meaning is unambiguous. Civilized society is sometimes said to be only a refinement of what is taken to be characteristic of the state of savage man, the bellum omnium contra omnes. The Latin word thus preserves the same double meaning. A similar distinction applies to the word both. "This man can walk on both legs" is not true in the distributive sense of both; whereas, "This man can hop on both legs" is true in both the distributive and in the collective sense of both.

An ambiguity attaches to the word some which has led to no end of trouble among the logicians themselves. Regarding the use of this term the Scottish logician Hamilton has this to say: "A remarkable uncertainty prevails in regard to the meaning of particularity and its signs. Here some may mean some only—some, not all, and is definite in so far as it excludes omnitude. On the other hand some may mean some at least—some, perhaps all." An ambiguity in the use of the copula or else in the use of the singular term would appear if it were argued that "Socrates is a man and man is a class" and that "therefore Socrates is a class." Sometimes the definite article in Eng-

lish individualizes. This is true in the phrase, "Have no fear the animal will find his way home." But when we speak of "the animal in man" or when we say "the dog is faithful to man," the case is reversed, for in these cases the effect of the definite article is to generalize. In English we remark that "man is unfaithful," but in Greek, in French, and in German the definite article is required before man, when we employ this word in the universal sense.

Ambiguities appear as often in our beliefs and attitudes as in our use of words and phrases:

"Seven wealthy towns contend for Homer dead,
Through which the living Homer begged his
bread."

And another case as proverbial in its own way may be cited:

"Le mariage est comme une forteresse assiégée; ceux qui sont dehors veulent y entrer, et ceux qui sont dedans veulent en sortir."

CASES OF EQUIVOCATION

An excellent illustration of equivocation is given by De Morgan. He says: "Governments permit what would otherwise be equivocation to take a strong air of truth, by legislating in detail against the principles of their own measures. The window tax is a special instance. A newspaper calls it

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a tax upon the light which God's beneficence has given to all. The answer would be plain enough, namely, that it is an income tax levied upon the use of that light which (how truly matters not here) is asserted to be a fair criterion of income. But this answer is destroyed by the permission to block up windows and thereby evade the tax, which is thus made to fall upon the light used, and not upon the means of using it which the size of the house affords. According to the criterion of this impost, the blocked window is as fair a criterion of the income of the occupant as the open one, and should have been so considered."

The following argument in favor of a protective tariff is not unusual. It has been said: "When we buy abroad, the domestic consumer will obtain the goods beyond doubt, but the foreign producer obtains the money. On the other hand, when we sell abroad the producer at home, while he gains the money, loses his goods. It will be better then to buy and sell at home, for in that case we retain both the goods and the money." As well might one argue: "When we buy at home, the producer loses the goods and the consumer loses the money. But every man is either a consumer or a producer or both. When we buy at home, it is clear, then, that we lose both the goods and the money." In both arguments the ambiguity of our terminology is patent enough.

In the history of logic there is an oft-recurring dispute as to whether logic is a science or an art. Its force depends in part, it may be, on an ambiguity in the sense of the word as employed by the Greeks. The Greek word $\lambda o \gamma \iota \kappa \eta$ is an adjective with some substantive (like study, problem, art) understood. The noun $\lambda \delta \gamma o s$ denoted either man's thought or his manner of expressing his thought (the ratio and oratio of the Romans), and hence originated the dispute first mentioned, for the derivative bore the same equivocation as the substantive from which it was derived.

The force of a very common remark that "we cannot conceive the infinite," often depends upon an equivocal use of the italicized term. Thus, we can readily conceive the series of natural numbers which is infinite, for we know how each term is formed from its predecessor. But we could not conceive it, if by this it is meant that each term is to be brought before the mind in succession until the last term is reached. Only an imprudent imagination would seek to accomplish what by definition it cannot do.

Taine in his work De l'Intelligence cites an equivocation of the same sort: "A name is general because it is abstract; it corresponds to a whole class, because the object it denotes, being but a fragment, may be found in all the individuals of the class, which, similar in this point, remain never-

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theless dissimilar in other points. . . . Can we have experience, perception, or sensible representation of this detached and isolated fragment? Assuredly not, for this would be a contradiction. . . I have not mentally a sensible representation of a pure or abstract polygon; for the pure polygon is a figure with several sides, but whose sides do not make up any particular number. . . . To tell one to see or imagine many sides, and at the same time not to see or imagine three, four, or any definite number of sides, is, in one breath, to order and forbid the same operation."

ACHILLES AND THE TORTOISE

No treatment of fallacies could well be regarded as complete without reference to a famous paradox, the one known as the race of Achilles and the tortoise. The case may be stated in a variety of ways. In most instances the solution turns upon an ambiguity in definition. De Quincey gives the following account in one of his essays, and, as it cannot be better related, we shall quote him at length:

"Achilles, most of us know, is celebrated in the Iliad as the swift-footed; and the tortoise, perhaps all of us know, is equally celebrated among naturalists as the slow-footed. In any race, therefore, between such parties, according to the equities of

Newmarket and Doncaster, where artificial compensations as to the weight of riders are used to redress those natural advantages that would else be unfair, Achilles must grant to the tortoise the benefit of starting first. But if he does that, says the Greek sophist, then I, the sophist, back the tortoise to any amount, engaging that the goddessborn hero shall never come up with the poor reptile. Let us see. It matters little what exact amount of precedency is conceded to the tortoise; but say that he is allowed a start of one-tenth part of the whole course. Quite as little does it matter by what ratio of speed Achilles surpasses the tortoise; but suppose this ratio be that of ten to one, then, if the race course be ten miles long, our friend the slow-coach, being by the conditions entitled to one-tenth of the course for his starting allowance, will have finished one mile as a solo performer before Achilles is entitled to move. When the duet begins, the tortoise will be entering on the second mile precisely as Achilles enters on the first. But, because the Nob runs ten times as fast as the Snob, whilst Achilles is running his first mile, the tortoise accomplishes only the tenth part of the second mile. Not much, you say. Certainly not very much, but quite enough to keep the reptile in advance of the hero. This hero, being very little addicted to think small beer of himself, be-

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gins to fancy that it will cost him too trivial an effort to run ahead of his opponent. But don't let him shout before he is out of the wood. For, though he soon runs over that tenth of a mile which the tortoise has already finished, even this costs him a certain time, however brief. And during that time the tortoise will have finished a corresponding subsection of the course—viz., a tenth part of a tenth This fraction is a hundredth part of the total distance. Trifle as that is, it constitutes a debt against Achilles, which debt must be paid. And whilst he is paying it, behold our dull friend in the shell has run the tenth part of a hundredth part, which amounts to a thousandth part. To the goddess-born what a flea-bite is that! True it is so, but still it lasts long enough to give the tortoise time for keeping his distance and for drawing another little bill upon Achilles for a ten-thousandth part. Always, in fact, alight upon what stage you will of the race, there is a little arrear to be settled between the parties and always against the hero. Vermin, in account with the divine and long-legged Pelides, Cr. by one billionth or one decillionth of course, much or little, what matters it, so long as the divine man cannot pay it off before another installment becomes due? And pay it off he never will, though the race should last for a thousand centuries."

HISTORICAL ATTEMPTS AT SOLUTION

It may be argued (as indeed it has been) that we may calculate the point where the race will end. Leibnitz remarks in a letter to M. Foucher that "P. Gregoire de St. Vincent has shown by mathematics the spot where Achilles must have caught the tortoise." But such a comment clearly misses the point. "Of course . . . it becomes easy, upon assuming a certain number of feet for the stride of Achilles, to mark the precise point at which that impiger young gentleman will fly past his antagonist like a pistol shot, and being also iracundus. inexorabilis, acer, will endeavor to leave his blessing with the tortoise in the shape of a kick (though according to a picturesque remark of Sidney Smith, it is as vain to caress a tortoise, or, on the other hand, to kick him, as it is to pat and fondle, or to tickle, the dome of St. Paul's). . . . It is precisely because Achilles will in practice go ahead of the tortoise, when, conformably to a known speculative argument, he ought not to go ahead . . . which constitutes our perplexity, or, to use a Grecian word still more expressive, which constitutes our aporia, that is, our resourcelessness." The same objection was made to Zeno himself, the author of the dilemma, for on one occasion, while expounding the argument, one of his listeners, without taking the trouble to reply, arose, walked a

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short distance, and then resumed his seat. By this gesture he imagined that he had refuted the argument in practice. But Zeno quite properly replied, "You do not refute me, sir, but only illustrate the paradox," for if bodies did not seem to move, the difficulty would not exist.

It is often said that had Zeno grasped the modern notion of the limiting value of the ratio of two infinitesimals, the paradox would have been reduced. The solution which Leibnitz offers in this same letter is: "Ne craignez point, monsieur, la tortue que les Pyrrhoniens faisaient aller aussi vite qu'Achille. Un espace divisible sans fin se passe dans un temps aussi divisible sans fin," and this is the one which De Quincey accepts: "The infinity of space in this race of subdivision is artfully run against a finite time, whereas, if the one infinite were pitted, as in reason it ought to be, against the other infinite, the endless divisibility of time against the endless divisibility of space, there would arise a reciprocal exhaustion and neutralization that would swallow up the astounding consequences, very much as the two Kilkenny cats ate up each other."

A CASE OF AMPHIBOLOGY

However, the solution here given equally misses the essential point, for it depends on a weak statement of Zeno's case. The real obstacle, the one

upon which the difficulty hinges, depends upon the impossibility of reaching the last term of an infinite series. Upon examination it will be found that the fallacy is really a concealed case of amphibology. An infinite series is defined as one that has no last term, and this condition is later revoked, the last term being reinvoked as a real obstacle for him against whom the argument is directed. Summarized, the stages of the proof are these: "To pass the tortoise Achilles must reach the last term of the series. But the series has no last term. Accordingly, the hero cannot come up with the reptile." The solution lies quite simply in the rejection of the major premise. If there is no last term, what justice in logic can require of Achilles that he pass through the last term in order to reach the limit? If the original definition excludes the last term as a possible obstacle, by what right is it later reinvoked as a real obstacle for him who denies the compulsion of the major premise?

CHAPTER III

SATIRE, EXAGGERATION, AND FALSE ASSOCIATION

Not all cases of equivocation are seriously intended, as when the ambiguity takes the form of a jest or pun. But these cases, too, have their serious side, and are effectively employed at times as rhetorical weapons in debate. A famous case is the conversation of Hamlet with the gravedigger:

Ham.—Whose grave's this, sirrah?

Clo.—Mine, sir.

Ham.—I think it be thine indeed, for thou liest in't.

Clo.—You lie out on't, sir, and therefore 'tis not yours: for my part, I do not lie in't and yet it is mine.

A PUN MAY HAVE A SERIOUS INTENT

A remark of Franklin's, "If we do not hang together, gentlemen, we may expect, each one of us, to hang separately," has a compulsion of its own, which is not of the logical kind. Suppose one were to say: "Shakespeare is not the author of certain

well-known plays; another writer of the same name planned and executed them." We are then left in doubt as to whether an ambiguity is intended or not. If Mark Twain were known to be responsible for the remark our doubt would be removed; but the authorship of Bacon, on the other hand, may be what another writer would have us infer.

Oliver Wendell Holmes says: "People that make puns are like wanton boys that put coppers on the railroad tracks. They amuse themselves and other children, but their little trick may upset a freight train of conversation for the sake of a battered witticism." The story is told of Madame de Staël that she once showed her foot at a masked ball to Antoine Rivarol, for her vanity deemed this a sufficient means of recognition, and that he exclaimed, Quel vilain piédestal. Doctor Johnson remarked that if he had been aware that Boswell intended to write his life, he would have prevented it by taking Boswell's. Wordsworth once said, if he had a mind, he could write like Shakespeare. Concerning this case Charles Lamb suggested: "It is only the mind which is lacking." Thus, an ambiguity which deceives no one may yet serve as an effective retort.

PARODY AND CARICATURE

Another class of ambiguities which lack a serious intent is the case of parody, and the implications

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of caricature are closely akin. The well-known lines,

"Man wants but little here below, Nor wants that little long,"

has been parodied in a dozen ways, of which

"Man wants but liquor here below, But wants that liquor strong."

is one of the best. Doctor Johnson said: "Sir, a woman's preaching is like a dog's walking on his hind legs. It is not done well, and you are surprised to see it done at all." A great deal of fun can be crowded into a simple parody. Here is an unusual example that is worthy of being quoted. De Quincey says: "Amongst the peculiar opinions which he [a certain Doctor Maginn] professed was this-that no man, however much he might tend toward civilization, was to be regarded as having absolutely reached its apex until he was drunk. . . . But as such an odiously long word [civilization] must ever be distressing to a gentleman taking his ease of an evening, unconsciously perhaps, he abridged it always after 10 P.M. into civilation. Such was the genesis of the word. And I, therefore, upon entering it in my neological dictionary of English, matriculated it thus: Civilation by ellipsis, or more properly by syncope, or rigorously speaking by hiccup, from civilization.

The phrase, "He enjoys good health," is sometimes parodied in a form that is not without rhetorical advantage. Thus we say of So-and-so that "he enjoys poor health," for there are many who make of their misery a comfort, either because of added attention on the part of others, or because they may at such times indulge their sentiment of pity for themselves. In cases akin to this, therefore, an ambiguity may serve effectively to point a criticism. To this class of ambiguities might be added the misuse of learned words, conscious or unconscious, as well as humorous affectations, such as are contained in the sayings of Sheridan's Mrs. Malaprop. Where the use of learned expressions is unnecessarily labored, precise, or merely overdone, the pedant is revealed. Goldsmith says of his village schoolmaster:

"In arguing, too, the parson owned his skill,
For, e'en though vanquished he could argue still,
While words of learned length and thund'ring
sound

Amazed the gazing rustics ranged around." . . .

SATIRE, IRONY, AND INNUENDO

An able speaker knows that his audience may often be won over to his own view by satire or irony, when his best logic has failed. The philosopher Renouvier used to remark that proof of the

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most rigorous kind may fail to convince. A famous example of innuendo is recorded of Whistler. He spoke of Ruskin's "flow of language that would, could he hear it, give Titian the same shock of surprise that was Balaam's, when the first great critic proffered his opinion." And when a correspondent observed, somewhat literally, that, after all, "the ass was right," Whistler rejoined, "But I fancy you will admit that this is the only ass on record that ever was right, and that the age of miracles is past." Leo X declared that "Erasmus injured us more by his wit than Luther by his anger." What could be more effective than Voltaire's comment when shown the poet Rousseau's ode on "Immortality"? "Voilà une lettre qui n'arrivera jamais à son addresse." But this "man of the century" was capable of turning the same weapon against himself. He was once showing to visitors his tomb built out from the outer wall in the church he had erected at Ferney and dedicated not to any saint, but Deo solo. "The wicked will say," he observed, "that I am neither inside nor yet outside of it." When a friend charged him with inconsistency on one occasion when he saluted the passing Host, Voltaire escaped with the remark, "We bow but we do not speak."

A sense of the more delicate kinds and gradations of humor is often an attribute of those who possess the logical faculty developed to a high de-

gree; perhaps for this reason, that humor is allied to paradox.

"A little nonsense now and then Is relished by the best of men."

Most notably was this true of the late Josiah Royce, a fact that will be confirmed by the opinion of anyone who may have listened to this philosopher's informal speech. The classic instance is the well-known trait in the character of Socrates, and finding expression as Socratic irony. That humor is related to matters of serious or sober intent was recognized by Boileau, when he wrote:

"Heureux qui, dans ses vers, sait d'une voix légère Passer du grave au doux, du plaisant au sévère."

THE FALLACY OF ACCENT

An ambiguity directly related to the cases that have just been cited, gives rise to what is termed the fallacy of accent. De Morgan says: "A person who quotes another, omitting anything which serves to show the animus of the meaning; or one who without notice puts any word of the author he cites in italics, so as to alter its emphasis; or one who attempts to heighten his own assertions, so as to make them imply more than he would openly say, by italics, or notes of exclamation, or otherwise—is guilty of the fallacia accentus."

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Patronage is sometimes invited, or the attention of a patron aroused by means of an ambiguous sign or advertisement:

What do you think
I'll shave you for nothing
And give you a drink

a certain barber is supposed to have placed on the sign above his shop. A visitor enticed within by the prospect of such superlative benefits would not suspect the true rendering of the lines:

What! do you think
I'll shave you for nothing
And give you a drink?

Another case is the meaning of the command, "Drink ye all of it," giving rise as it has to semi-serious sectarian controversy, although the original Greek is unambiguous.

CONSCIOUS EXAGGERATION

Fallacies often result when the rhetorical device of conscious exaggeration is employed. Such instances may be serious or they may lack a serious intent. As a case in point consider a story of Fontenelle's from his *Dialogues of the Dead*. Dido has complained to one of her companion spirits that the poet Virgil had misrepresented her

relations with Æneas, nay, had constructed the entire plot of the poem out of whole cloth:

"If my alleged flirtation were only plausible, I should not object to the suspicion; but he has given me for a lover, Æneas, a man who was dead three hundred years before I was born."

"What you suggest is, it must be allowed, in some sort an obstacle. But Æneas and yourself seem to have been made for each other. Both of you had been forced into exile; the destiny of each was set in foreign lands; you were a widow, he a widower; what a world had you not in common! It is true that you were born three hundred years later than he, but Virgil had reasons enough for bringing you together. The matter of three hundred years, when all is said, was not his affair."

"What sort of argument is this? What! Three hundred years are not three hundred years? And in spite of this obstacle two persons can meet and love?"

"It is certain that on this one point Virgil understood fine distinctions. He was certainly a man of the world. He would have it known, that in matters that concern the heart, one must not judge by appearances; that what is the least plausible in such circumstances is often the most true."

It is here impossible to recover adequately the grace and playfulness of the original text. The

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serious note is not struck until the final phrase is reached. It has been said that the French manner in the treatment of satire, irony, wit, and humor, is the result of a felicitous union of the Celtic temperament and the scholastic logic; the playful nature of the Gaul reacting to the discipline of intellectual rules. The enormous influence of logic in the formation of language and of literary taste, especially in the middle ages, has not always been understood and truly valued by historians.

Sometimes conscious exaggeration is to be taken seriously, as when its expression rises to poetic pitch. Compare in this connection the following passage from that extraordinary work the *Ecce Homo*: "With it (my Zarathustra) I bequeathed to my fellowmen the richest boon that has ever been conferred upon them. This book which lifts its voice above the centuries, is not alone the most sublime of all books, the book of mountain air—mankind as an actuality lies in the infinite depths beneath it—but it is as well the most profound of all, born in the innermost kingdom of truth, an inexhaustible well, into which no vessel can be lowered without coming up laden with gold and with goodness."

It is not, however, that such flights of fancy are always to be justified by mere poetic license. "They tell me," Nietzsche once observed, "that I

am the event of the century. Nay, I may even constitute the necessary and fateful link that joins ten thousand centuries."

FALSE ASSOCIATION

One thinks of many instances, wherein one idea may be distorted and so misrepresented by mere association with another. This linking of two things which have nothing, or next to nothing in common, is very constantly employed. "Words, words, words," is sometimes an effective reply, whose success depends upon this same rhetorical trick of juxtaposition. Mr. Shaw likes to associate his own name with that of Shakespeare. Nietzsche exposes a case of this sort, when he exclaims indignantly, "Goethe and Schiller," and proceeds to enumerate other ands that are no less objectionable. But Nietzsche himself is a past master in the art of the ironical juxtaposition of terms. Compare in this context the following paragraph, which, however, is quoted only in part:

"My Impossibles. — Rousseau: or the return to nature in impuris naturalibus. — Dante: or the hyena who writes poetry among the tombs. — Hugo: or the lighthouse on the sea of nonsense. — George Sand: or lactea ubertas, in plain English: the ink-cow with plenty of beautiful ink."

SATIRE AND EXAGGERATION

THE EXAMPLE OF COURNOT

A fallacy analogous to the one that depends upon a false association of the sort described is mentioned by the philosopher Cournot and consists in a vulgar tendency to attach a providential or it may be a cosmic significance to coincidences that are merely fortuitous. He supposes the case in which two brothers serving in different armies, the one on the northern frontier, the other at the foot of the Alps, die in battle at the same hour. The circumstance is fortuitous because the causal chains, on which each happening depends are independent of one another. "It is because chance effects such combinations that they are rare, and it is because they are rare that they cause surprise." It would surprise no one if the two, members of the same corps, should die in the same battle on the same front. This does not exclude the possibility, on Cournot's views, that such fortuitous coincidences, are oftentimes determining causes. shock to a parent, fatal we will say in the case supposed, might have been survived if the two deaths had been separated by an interval of time.

MANY QUESTIONS

To the fallacy of many questions are usually referred all cases in which too many meanings are

contained, or in which the issue on that account is generally confused. A good example is the conversation in Hamlet between the grave-diggers. Here the first remark is not in the form of a question, but calls, none the less, for a reply. The fallacy might be termed equally well the fallacy of many statements. The example will illustrate, too, what is called in logic a case of non sequitur.

First Clo.—If the man go to this water and drown himself, it is, will he, nill he, he goes; mark you that; but if the water come to him, and drown him, he drowns not himself: Argal, he, that is not guilty of his own death, shortens not his own life.

Second Clo.—Will you ha' the truth on't? If this had not been a gentlewoman, she should have been buried out of Christian burial.

Other fallacies are committed without the intention that they be taken seriously. Polonius conveys a sly hint to Hamlet when he says:

"If you call me Jeptha, my lord.

I have a daughter that I love passing well;"

and Hamlet as slyly escapes by pretending that the remark contains a formal fallacy, for he rejoins:

"Nay, that follows not."

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Nothing brings a conversation more abruptly to an end or more quickly disarms an opponent than the habit of taking him literally, for, arguing as it does a lack of imagination and even a lack of intellect, he is at once aware that the discussion cannot be maintained on the projected level. Nor does this habit characterize the unlettered only. Many an excellent scholar will betray the essential poverty of his mind by traits which point the same moral, by his attachment to words rather than meanings, or by his scorn of a style that is elegant because elevated, or, again, let us say, by his liking for what he calls the impersonal (i.e., literal) narration of history.

CONSCIOUS AMBIGUITIES

There is another large and important class of fallacies rather neglected, I think, by the logicians; arguments, which are not to be taken literally, but for a reason very different from the one that applies to the illustrations enumerated above. These are statements which are formally correct, but in which an ambiguity of terminology is intended, it may be for rhetorical purposes. Even the unlettered will not take you literally, if you remark that "business is business." The formal correctness of the phrase tends to force its acceptance, but it is quite evident that more is meant than

meets the ear. Again, if I assert that "man is a vertical animal," it will be clear that more than a mere tautology is meant. It is said of Lincoln, while making a tour of the trenches after a brisk fight, that he remarked, with evident disgust of the whole affair (I quote from memory), "Anyone who likes this sort of thing must enjoy it very much." If it be said that "a man is a man for all that," it is to call attention to the fact that a tautology is not always true; that rather "a man is not himself sometimes." When the king and the others have left the play and Hamlet is left with Horatio, he says:

"For if the king like not the comedy, Why then, belike, he likes it not, perdy,"

meaning that the burden of a bad conscience is the king's and not his.

Professor Stratton in an article appearing in the Atlantic Monthly says: "It is a prevailing belief that the mind is a convenient name for countless special operations or functions" and that these are independent. "When you have trained one of these you have trained that limited function and none other. What you do to the mind by way of education knows its place; it never spreads. You train what you train." Here the formal correctness of the tautology seems to reinforce the argument. But this view of the character of mind ignores

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many important facts. "The psychological experiments which have so troubled the waters of education prove that normally you train what you do not train." And, again, the conscious fallacy, the deliberate offense again logic, is correctly employed in favor of the opposite view.

In those verses of Lewis Carroll, which he calls "The Three Voices," the man in the piece, who has been accused by the lady of giving himself over to the exclusive instincts of his gourmandizing self,

urges in his own defense that

"Dinner is dinner, tea is tea."

His defense is undermined, however, by her resolve to take his statement only at its face value, for she replies:

> Let thy scant knowledge find increase; Say men are men, and geese are geese."

Here the intent is not only to overthrow the opponent's argument, to render his contention impotent by refusing his implied ambiguity; but also to make a joke at the expense of logic itself, which is thus charged with giving us in its implications no information that we did not have before.

CHAPTER IV

SPECIAL CASES OF NON SEQUITUR

I F facts do not agree with the theory, so much the worse for the facts." In common thinking this utterance is typical of any man who stands ready to pervert the truth. Facts constitute a last court of appeal to which theory must conform. The philosopher, however, does not altogether share this view of common sense. He is apt to point out that a fact derives its meaning in relation to some hypothesis, consciously or unconsciously assumed; he does not altogether indorse the view that facts are the hard and fast things that naïve reflection takes them to be. But this view of the case by no means implies that there is no such thing as misstatement of fact, which is, after all is said, the matter that concerns us here. Whistler used to take delight in making a mystery of the date and place of his birth, a "part of his habitual indifference to the sober requirements of those solemn metaphysical entities, time and space." "I never was born," he would say, "I came from on high."

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MISSTATEMENT OF FACT

Misstatements of fact are commonly made under conditions of extreme provocation. In the heat of argument even obvious matters of fact may be denied, when a disputant sees that their admission would be damaging, or, it may be, fatal to his point of view. A Cambridge tutor, on being asked if he would admit that "the whole is equal to the sum of its parts," replied: "Not until I know what use you propose to make of the admission." Beaten in an argument, a disputant has even been known to take the ground:

"Certum est, quia impossibile est,"

a defense that yields to no direct attack. "Germany was amazed," said a well-known philosopher in 1914, "to find that suddenly all Germans were called Bernhardisten." In his "large circle of acquaintances," he said, he "knows not one who ever read Bernhardi, Nietzsche, or Treitschke."

"On peut dire que son esprit brille aux dépens de sa mémoire."

Adolph Lasson, a Privy Councillor and Professor of Philosophy in the University of Berlin, remarked at the time of the German invasion of Belgium in a much-quoted letter printed in an Amsterdam *Review:* "Our law is reason, our strength

the strength of the spirit, our victory the victory of thought. We are truthful, our characteristics are humanity, gentleness, and conscientiousness, the real Christian virtues. In a wicked world we represent love and God is with us." Here, indeed, is the case of an old man whose view of facts is retrospective, who was thinking of a Germany of the past. This interpretation is well proven, for his attitude was hotly resented by some of the Germans themselves. Thomas Mann (Neue Rundschau, November, 1914) accepts the accusations of the Allies, declaring that the war is a war of German Kultur "against civilization":

"Denn der Mensch verkümmert im Frieden, Müssige Ruh ist das Grab des Muts. Das Gesetz ist der Freund des Schwachen, Alles will es nur eben machen, Möchte gern die Welt verflachen, Aber der Krieg lässt die Kraft erscheinen"...

and announcing that German thought has no other ideal than that of militarism. On the other side a Frenchman declared that the Prussians do not belong to the Aryan race; that they descend in the direct line from the men of the Stone Age called Allophyles and that

"Le crâne moderne dont la base, reflet de la vigueur des appétits, rapelle le mieux le crâne de

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l'homme fossile de la Chapelle-aux-Saints, est celui du prince de Bismarck."

But the tradition of the great Goethe was not altogether dead even in those days. While these ragings were going on, Hermann Hesse composed his "prayer to the peace."

"Jeder hat's gehabt, Keiner hat's geschaetzt, Jeden hat der süsse Quell gelabt, O wie klingt der Name Friede jetzt!"

"Klingt so fern und zag, Klingt so tranenschwer, Keiner weiss und kennt den Tag, Jeder sehnt ihn voll Verlangen her."

IGNORATIO ELENCHI

The fallacy of ignoratio elenchi, or ignorance of the refutation, occurs whenever one is convicted of arguing to the wrong point, or whenever the inference to be drawn is generally confused. "I am not ridiculed," said Diogenes in reply to certain ones who derided him. One cannot be ridiculed unless the ridicule applies. Cases in which it is not easy to say what fact is most plausibly inferred from a given utterance and which are really concealed forms of the ignoratio elenchi might readily be

given. Richard Porson on one occasion was invited to stay to dinner. "Thank you," he answered, "I dined yesterday." Only a person conversant with the scholar's habits of routine might safely have divined his meaning. Porson dined and fasted at irregular intervals. De Morgan cites the following instance:

"If a man were to sue another for debt, for goods sold and delivered, and if the defendant were to reply that he had paid for the goods furnished, and plaintiff were to rejoin that he could find no record of that payment in his books, the fallacy would be palpably committed. The rejoinder supposed true, shows that either the defendant has not paid, or plaintiff keeps negligent accounts, and is a dilemma, one horn of which only contradicts the defense. It is plaintiff's business to prove the sale from what is in his books, not the absence of payment from what is not; and it is then defendant's business to prove the payment by his vouchers." The same author remarks:

"A great deal of what is called evasion belongs to his head, or to that of the *ignoratio elenchi* as the sophist answers. The advocates, for instance, of the absolute unlawfulness of war never tell, unless pressed, what they think of the case of resistance to invasion. Is the country to be given up to the first foreigner who comes for it? Sometimes the extreme case comes into play: sometimes the

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assertion that no one will come; which is irrelevant as to the question what would be right if he did come."

Another example, in which an opponent has inferred more than was intended, may also be cited: "A writer disclaims attempting a certain task as above his powers, or doubts about deciding a proposition as beyond his knowledge. A self-sufficient opponent is very effective in assuring him that his diffidence is highly commendable, and fully justified in the circumstances."

IMPLICATIONS THAT ARE NOT DESIGNED

An excellent example of the *ignoratio elenchi* is contained in one of Hamlet's replies to Horatio and Marcellus. It was a favorite trick of the Prince of Denmark to return an answer that had nothing to do with the case, when he wished to conceal the true nature of his opinion. He says:

"There's ne'er a villain dwelling in all Denmark But he's an arrant knave."

And to this seemingly irrelevant remark Horatio rejoins:

"There needs no ghost, my lord come from the grave,

To tell us this."

Now, one of the speediest means of bringing a discussion to an end is to accept an opponent's assertion in its literal meaning and by refusing to draw any inference at all. Accordingly, Hamlet remarks:

"Why, right; you are in the right; And so, without more circumstance at all, I hold it fit, that we shake hands, and part."

Again, a conviction or an act may be misrepresented, or an opinion may be retorted, by seeking an implication that was not designed. John Adams was once dining at the house of Judge Paine, who was a loyalist. When the host gave as a toast "the King," some of the guests would have refused to comply, had not Adams insisted. The latter then proposed a toast to "the Devil." The host was about to demur when his wife intervened: "My dear, as the gentleman has seen fit to drink to our friend, let us by no means refuse, in our turn, to drink to his."

The story is told of Whistler, that one day in a shop a customer, mistaking him for a salesman, rushed up to him and remarked: "I say, this 'at doesn't fit." "Neither does your coat," said Whistler, eying him critically.

A case in which the traits of a man's character are somewhat ironically inferred from his behavior, and which might be listed under this head, is con-

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tained in the following anecdote: The dramatist Piron and the poet Jean Baptiste Rousseau were walking one day in a solitary place. At the sound of the Angelus Rousseau fell on his knees. "It is unnecessary," Piron remarked, "God alone observes us."

POPULAR JUDGMENTS

Intolerance in the search for truth is often mistakenly charged by popular opinion to the expert or specialist in some department of knowledge, because he rejects without the trouble of examination the claims of some self-taught thinker. Cures extravagantly alleged to have been effected in independence of biological law, or the discovery of unknown facts through the revelations of returned spirits, suggest themselves as possible cases in point. William James urged what he called "fair play" in matters of this sort, but the nature of his liberality has been conveniently misunderstood and misrepresented by partizans on both sides. De Quincey's treatment of the case of those who pretend to have "squared the circle" might well serve as a model of refutation for claims thus mistakenly advanced:

"The general or unmathematical public are in a continual delusion about the nature of the barrier which separates us from the perfect solution of these problems. Every six months the news-

papers announce that some self-taught mathematician or original genius has succeeded in squaring the circle. Upon this, the mathematician, without troubling himself to inquire into the particular form of this man's nonsense, contents himself with laughing. And to this laugh the non-mathematical observer replies by saying, or thinking, that previous to inquiry such a contemptuous dismissal of any man's pretensions is illiberal. . . . The man might fairly protest: Measure the value of my talent by the discovery I offer, and not the value of my discovery by my talent wantonly and invidiously assumed. Or, he might say (referring to Archimedes, Leibnitz, Euler, who had failed): Not as equal, still less as superior to these great men, but as standing on their shoulders, I pretend to have seen farther than they; or . . . simply insisting on the accidental difference of the station from which he had contemplated the question at issue; on any of these grounds, the candidate for the honors of discovery might roll back the burden of invidious feeling upon those that laughed at him in limine, were the barrier between us and the discovery of these truths merely subjective. But it is not so. The barrier is objective; it lies not in the person attempting but in the thing attempted. . . . The objection, therefore, to a pretended squarer of the circle is not: You, sir, by adding to our knowledge in a point impregnable to others,

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would compel us to believe you a greater than the greatest of those we honor; But this: You, sir, by propounding a discovery that would unsettle the foundations of our former knowledge, oblige us to disbelieve you on the faith of that very science to which you do and must appeal."

De Morgan has this to say on the same theme: "All the makers of systems who arrange the universe, square the circle, and so forth, not only comfort themselves by thinking of the neglect which Copernicus and other real discoverers met with for a time, but sometimes succeed in making followers. These last forget that for every true improvement, which has been for some time unregarded, a thousand absurdities have met that fate permanently.

. . . Doctor Johnson tells a story of a lady who seriously meditated leaving out the classics in her son's education, because she had heard Shakespeare knew little of them. Telford is a standing proof (it is supposed by some) that special training is not essential for an engineer."

FALLACY OF AFFIRMING THE CONVERSE

There exists a very human tendency to affirm the converse of some proposition whose truth is granted, when the converse seems to support some fact that we should like to believe. Supposing it true that most artistic geniuses wear the hair long,

some men try to create an impression of their talents by allowing the hair to grow or by wearing a wig. As already cited, it is supposed that the little Latin and less Greek that entered into the education of a Shakespeare has only to be adhered to in principle in order to produce his equal. We are constantly tempted to assume the converse of well-established truths. Consider the following passage from Emile Boutroux:

"The best men in a nation, says Renan, are those it crucifies. Martyrdom is the ransom of superiority. Death, then, is a witness to the effort made by the living being to rise above the environment in which he was born. Defeat is the mark of his greatness."

This passage is full of statements that are converted with some show of truth and analogous ones have become proverbial. The assumption of martyrdom in connection with the difficulties and distresses of daily experience is supposed to suggest vaguely a being morally superior to the petty circumstances in which he finds himself.

CHAPTER V

BEGGING THE QUESTION

A NOT uncommon fallacy is the one wherein we apply the axiom that "the whole is equal to the sum of its parts" to wholes that are not merely collections, but highly organized collections as well; wherein we assume that the properties of the whole are to be found in the parts, or that the properties of the parts added together will yield the properties of the whole, and conversely. Thus, the properties of water are not those of hydrogen and oxygen taken together. The characteristics of a jury are not to be found among the individuals that make it up.

In the second book of the Republic of Plato Socrates proposes to resolve the difficult problem of the nature of the just man by considering the same problem in relation to the larger whole of the state. He says:

"We speak of justice as residing in an individual mind and as residing also in an entire city do we not?... Perhaps, then, justice may exist in larger proportions in the greater subject, and thus be easier to discover; so, if you please, let us first

investigate its character in cities; afterwards, let us apply the same inquiry to the individual, looking for the counterpart of the greater as it exists in the form of the less."

THE MATERIALISTIC FALLACY

While Socrates in this instance does not actually commit the fallacy in question, a breach of the proposed rule is certainly suggested. Emile Durkheim, the eminent sociologist, insists upon this point again and again. On his view a social fact is not a simple sum of facts that concern the individual. The properties of the whole are not here the sum of the properties of the parts that make it up. "Private sentiments do not become social save by combining under the action of forces sui generis which develop association; as the result of these combinations and mutual alterations, they become something else." Sociology deals with collective representations and therefore does not recognize the method of psychology or of anthropology as sufficient to deal with its subject-matter. "The causes of social facts must always be sought among other facts themselves social in character." When "a social fact is explained directly by psychical phenomena, one may rest assured the explanation is false." Thus when one ascribes the artistic character of Athenian civilization to the congenital

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powers of the race, "one proceeds as they did in the middle ages," by begging the question, "when they explained fire by phlogiston and the effects of opium by its dormative virtue." It is necessary "to explain the phenomena which are produced in the whole by the properties characteristic of the whole, the complex by the complex, social facts by society."

A FORMAL FALLACY IN EUCLID

If two or more propositions are true together, then any one may be taken to be true separately. This, like some others of the axioms of logic, may appear trivial at first blush. An important fallacy, however, originates in connection with it and in the following manner: Suppose that some proposition, whose truth we are seeking to establish, is only another form of some assertion, or set of assertions, whose truth is granted at the outset of our proof. It will then be easy to obtain the conclusion desired from the premises assumed, and if we should assume the right to assert the conclusion by itself, that is, in independence of the premises, we should commit the fallacy that goes by the name of petitio principii.

This breach of the rules of correct inference, which is commonly known as the fallacy of "begging the question," consists then in covertly assuming the truth of some principle equivalent to the one

we are seeking to establish. Serious cases of this error might be drawn from the history of the sciences or from the philosophical disciplines. Thus, in the sixteenth proposition of the first book of his Elements, Euclid fails to state one of the axioms that is essential to the rigor of his proof, the axiom that two straight lines cannot intersect in more than one point. Now this omission entailed very serious consequences. Many eminent mathematicians of modern times, overlooking the error and assuming this proposition to be demonstrated, were able to establish certain truths which depend upon the axiom in question, such as "the fourth angle of a trirectangular quadrilateral cannot be obtuse" and "the angle sum of the triangle cannot be greater than two right angles," propositions inconsistent with a geometry that is now known to be possible and known as the geometry of Riemann. A somewhat similar fallacy is committed by the Italian geometer Saccheri in the thirty-third proposition of his book entitled Euclid Freed of Every Blemish (1733) by means of which he establishes the truth of Euclid's fifth postulate.

Most of the apparent demonstrations of Euclid's parallel axiom are cases of petitio principii, and such instances are very common indeed in the history of geometry. Always the demonstrator assumes tacitly some axiom that is only a disguised expression of the principle he seeks. For two thou-

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sand years the error has been committed again and again. In regard to his own efforts to establish a rigorous proof of this principle, the great geometer Gauss said in the year 1799: "Certainly I have come upon much that for the majority would pass as a proof, but in my eyes demonstrates nothing." The story is told of Lagrange that he on one occasion presented a memoir on the theory of parallels to the members of the French Academy, but withdrew the manuscript, when halfway through the reading, with the remark, "Il faut que j'y songe encore."

FURTHER EXAMPLES OF PETITIO PRINCIPII

Karl Pearson in his Grammar of Science is guilty of a fallacy of this same sort. He compares the mind to a clerk in a telephone exchange, who receives his messages at the brain terminals of the sensory nerves. "Messages in the form of sense impressions come flowing in. . . . But of the nature of things-in-themselves, of what may exist at the other end of our system of telephone wires, we know nothing at all."

It is evident, if we take this analogy seriously, that we have assumed not only the existence of an external world, but also that we know at once a great deal about it. We imagine we know, for example, that the nerves are *like* wires, however much we may be deceived by the messages which they

convey. Of this case Professor Fullerton remarks: "It is interesting to see how a man of science, whose reflections compel him to deny the existence of the external world, that we all seem to perceive and that we somehow recognize as distinct from anything in our minds, is nevertheless compelled to admit the existence of this world at every turn."

Kant's second argument for the a priori character of space in the second edition of the Kritik seems to be a case in kind. He says: "One can never represent to himself that there is no space, although one can easily imagine that no objects are to be found in space." This means, it may be presumed: One can imagine objects moved out of a given space, but one cannot imagine space moved out of space. If this be a fair statement of the case, then we are asked to do that, which, by definition, we cannot do, and the odd compulsion of the argument contains no other kind of necessity than this.

Henri Poincaré mentions a case in which we should "beg the question" if we should try to settle a certain issue experimentally. We should always prefer to attribute the outcome of an experiment that would decide between the Euclidean and the Riemannian hypotheses in geometry, to the errors inherent in observation. But the very condition which is in question, would really be read into the conditions that surround the experiment and so would naturally be found to be verified there.

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DEFINITION IN A CIRCLE

This case is of the highest importance in relation to the method of science, in particular in its relation to those delicate questions which center about the foundations of mathematics. The Italian geometer Veronese has been guilty of a fallacy of this sort. Thus, he defines the equality of numbers in the following way: "Numbers whose units correspond to one another uniquely and in the same order and of which the one is neither a part of the other nor equal to a part of the other are equal." Regarding this definition Georg Cantor observes:

"This definition of equality contains a circle and thus is meaningless. For what is the meaning of "not equal to a part of the other" in this addition? To answer this question we must first know when two numbers are equal or unequal. Thus, apart from the arbitrariness of his definition of equality, it presupposes a definition of equality, and this again presupposes a definition of equality, in which we must know again what equal and unequal are, and so on ad infinitum. After Veronese has, so to speak, given up of his own free will the indispensable foundation for the comparison of numbers, we ought not to be surprised at the lawlessness with which, later on, he operates with his pseudotransfinite numbers, and ascribes properties to them which they cannot possess simply because

they themselves, in the form imagined by him, have no existence except on paper. Thus, too, the striking similarity of his "numbers" to the very absurd "infinite numbers" in Fontenelle's Géométrie de l'Infini (Paris, 1727) becomes comprehensible. Recently W. Killing has given welcome expression to his doubts concerning the foundation of Veronese's book in the Index lectionum of the Münster Academy for 1895-1896."*

THE INCOMPLETE DISJUNCTION

The fallacy that results when we are asked to choose between two alternatives that do not exhaust the possibilities of any given case, is so common and so treacherous that it deserves to be well studied and understood. Thus Herbert Spencer in his Sociology attacking the "great man theory" of history, employs a disjunction that is incomplete. He says: "Whence comes the great man? . . . The question has two conceivable answers: his origin is supernatural or it is natural. Is his origin supernatural? Then he is a deputy god and we have theocracy once removed. . . . Is this an unacceptable solution? Then the origin of the great man is natural; and immediately this is recognized, he must be classed with all other phenomena in the

^{*} Cantor's Theory of Transfinite Numbers trans. by Jourdain, Open Court, 1915.

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society that gave him birth as a product of its antecedents."

A critic of this argument might suggest the following objections: If the term "natural origin" refers to an "environment" external to the man himself the argument is clearly false for the disjunction is not complete. It is not clear that what "original nature" one man brings with him into his environment is the same as what another might have brought. If on the other hand the "natural origin" refers to an environment so broadly defined as to include the man himself, then Spencer is open to the very charge of vagueness which he somewhat arrogantly urges against the opponents of his view. William James who quotes and criticizes this passage, exclaims:

"This outery about the law of universal causation being undone . . . makes one impatient. These writers have no imagination of alternatives. With them there is no tertium quid between outward environment and miracle. Aut Cæsar, aut nullus! Aut Spencerism, aut catechism!"

THE FALLACY OF ACCIDENT

Many are the forms which the fallacy of accident may take on. I recall an argument, in which a man who was a good Grecian, though of poor logical pretentions, maintained that the term "classics"

was only properly applied to the works of Greek and Roman writers. His general position in the matter amounted briefly to this: that he believed in calling things by their right names; that the common sense significance of terms is weakened or altogether lost by arbitrarily making them mean too much or too little. And yet this man must have known that the term "classic" was applied by the Romans to writers of the first rank, as to those who had "class." "Where Macgregor sits, there is the head of the table." It was the spirit of this maxim which this stubborn antiquarian denied.

When a man holds thus insistently to his own meaning of a word, it is wise to look about for hidden motives, and in his case these were easily found among his known opinions. Largely ignorant of the literature of modern Europe and, in any case, in no position to argue successfully that there are no modern works comparable to those of Greece or Rome, that is to say, no modern classics, he insisted upon the meaning of the word in its accidental sense; but with this end in view: The word once accepted in its accidental sense, he would have applied, either then, or at some convenient later date, in its essential meaning; he would then have enforced upon us all his favorite thesis, that only the "classical" writers have class, that is, possess preëminent rank. This homo unius libri, like others of his sort, was a stubborn disputant.

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This case will illustrate one form of the fallacy of accident. As a further example consider a tale from Boccaccio which is cited by De Morgan:

"A servant who was roasting a stork for his master was prevailed upon by his sweetheart to cut off a leg for her to eat. When the bird came upon the table, the master desired to know what had become of the other leg. The man answered that storks had never more than one leg. The master very angry, but determined to strike his servant dumb before he punished him, took him next day into the fields where they saw storks, standing each on one leg, as storks do. The servant turned triumphantly to his master; on which the latter shouted and the birds put down their other legs and flew away. "Ah, sir," said the servant, "you did not shout to the stork at dinner yesterday; if you had done so, he would have shown his other leg too."

The servant had humorously assumed that what can be predicated in general of storks, can be predicated of roasted storks as well. Another example of De Morgan's deserves to be cited as well:

"The law in criminal cases demands a degree of accuracy in the statement of the secundum quid, which many people think is absurd. . . . Take two instances as follows: Some years ago, a man was tried for stealing a ham, and was acquitted on the

ground that what was proven against him was that he had stolen a portion of a ham. Very recently a man was convicted of perjury, in the year 1846, and an objection (which the judge thought of importance enough to reserve) was taken, on the ground that it ought to have been in the year of our Lord 1846. . . . In the two instances, which by many will be held equally absurd, a great difference will be seen by anyone who will imagine the two descriptions, in each case, to be put before two different persons. One is told that a man has stolen a ham, another that he has stolen a part of a ham. The first will think he has robbed a provision warehouse, and is a deliberate thief; the second may suppose that he has pilfered from a cook shop, possibly from hunger. As things stand, the two descriptions may suggest different amounts of criminality, and different motives. But put the second pair of descriptions in the same way. One person is told that a man perjured himself in the year 1846; and another that he perjured himself in the year of our Lord 1846. As things stand, there is no imaginable difference; for there is only one era from which we reckon." Mr. Alfred Sidgwick says:

"One reason why clever young people are specially addicted to wordiness is that their confidence in the axioms of logic is not yet much tempered by experience. . . . As the old logicians used to put

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it. A secundum guid is not the same as A simpliciter. But modern logic leads us to doubt whether, in the world of fact, there is (strictly speaking) any such thing as A simpliciter, and thus to doubt whether the law of identity has any application at all except by consent of both parties to a dispute. . . . Where we are dealing with things that can be weighed and measured in the laboratory; where analysis and synthesis can be instrumentally checked and corrected at every step; this risk, though never entirely absent, is at its lowest, and therefore definition of the terms is seldom called for. Where, on the other hand, large and obviously complex matters, such as political and industrial phenomena, are dealt with, and much artificial simulation is needed to enable us to deal with them at all, the risk of verbalism is at its height. Every A in politics and economics is A secundum quid. and yet we are constantly tempted to treat it as A simpliciter."

A SOPHIST IN SEARCH OF A DINNER

A case that properly falls under this head, that of the fallacia accidentis, is the tale told of a certain sophist, who was accustomed to approach his opponent bearing in his hands a covered dish. He would then inquire of the latter if he knew of a certainty that all chicken meat is nourishing. His

opponent would at once subscribe to this as a medical fact of the most indubitable sort; for this principle might be termed an axiom of the Greek pharmacopæia. Asked if he knew that what was in the dish was nourishing and on receiving a negative reply, the knavish Athenian would remove the lid and display the chicken meat contained therein. It was vain for the victim of the argument who had thus contradicted himself, to plead a prior ignorance of the fact. What is known in general, or as a principle, is known in each one of its particular applications. What is known to be true of all chicken must be known to be true of this sample along with the rest.

CHAPTER VI

HUMOROUS SITUATIONS AND LITERAL STATEMENT

WHILE it is the intention of this essay to list and in part to classify some of those ambiguities that lead to erroneous opinions, we can hardly fail to note cases that present a humorous as well as a serious side. Such illustrations may be multiplied without limit. They are the stock in trade of the writer of comedies.

AMBIGUITIES THAT CAUSE HUMOROUS SITUATIONS

Horace Greeley once received an urgent invitation to lecture in a distant state. He replied:

"Dear Sir,—I am overworked and growing old. I shall be sixty next Feb. 3rd. On the whole, it seems that I must decline to lecture henceforth, except in this immediate vicinity, if I do at all. I cannot promise to visit Illinois on that errand—certainly not now."

While the defects of Greeley's chirography were notorious, and were of course through his relations

with compositors, if for no other reason, well known to himself; nevertheless, the reply which he received by return mail, must have furnished some surprise. The substance was this:

"Dear Sir,—Your acceptance to lecture before our association came to hand this morning. We would say that the time you propose, Feb. 3rd, and terms, sixty dollars, are entirely satisfactory to us. As you suggest, we may be able to obtain for you other engagements in this immediate vicinity."

Another case of ambiguity, which is worth recording for its own sake, is the story told of Sir Walter Raleigh, who recently visited an American university in order to deliver a lecture. The president, preoccupied with the necessity of keeping a pressing engagement, had delegated one of his younger instructors to meet the visitor at the train. "You will have no difficulty in recognizing this gentleman," he said. "Go to him directly, introduce yourself, and present my apologies for not having come." Now as the matter turned out, the expected visitor had missed the train, and the person addressed, of distinguished appearance, was a wellknown banker of New York. This person had been warned in advance of the pranks which undergraduates are known to practice and was determined to nip such undertakings in the bud. "Sir Walter Raleigh, I presume?" said the young in-

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structor, addressing his distinguished stranger. "You are in error, sir," said the other. "I am Christopher Columbus. You will discover Sir Walter in the smoking car playing poker with Queen Elizabeth."

The subject of student pranks suggests another case which depends upon an ambiguity of an unusual kind. A woman who had been in the habit of letting rooms in the Latin Quarter to students, had become much attached to a tiny tortoise recently acquired. To her amazement the animal grew rapidly week by week until it had attained enormous size. Her roomers had replaced the pet each day by a larger duplicate. Then, when the maximum had been reached, this mushroom of the animal kingdom began to shrink. Gradually, becoming smaller and smaller for a number of weeks, the reptile slowly and unostentatiously resumed its original size; and in this state it remained to the time of its death some years later on.

AGREEMENT TO DISAGREE

While agreement on the part of disputants is commonly the end of discussion, rare are the cases where discussion might not be prolonged. Agreement in this sense is scarcely ever real. There are cases, indeed, where it is purely verbal; and there are cases where its verbal character is so patent that

a continuation of the argument is actively provoked. The Frenchman Fontenelle detested controversy to the point that he would refuse to differ with any chronic organizer of disputes,

"Where nature's end of language is declined, And men talk only to conceal the mind,"

declaring habitually that "all things are possible and that every man is in the right." He knew how to vary this formula, however, so that sometimes his answer had a sting. In his old age he was advised by his physician that the action of coffee on the human system is like that of a slow poison and should be abjured. "I quite agree with you," he replied, "and I have stoutly held to this opinion for more than eighty years."

But the refusal to meet an opponent on ground of his own choosing may take on other forms. When the Curé Freudenberger published a book entitled William Tell: a Danish Fable, the Swiss canton of Uri caused the work to be burned. To this case one might well apply the saying of Camille Desmoulins, one of the figures of the Revolution, and which has become proverbial:

"Brûler n'est pas répondre."

This reply he made to Robespierre, whose measures the Dantonists were then opposing.

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WHISTLER VERSUS RUSKIN

The refusal to take a statement in its literal sense is always a tax on a man's intellect and imagination. It is commonly a simple affair, therefore, to get the average man to subscribe to the specious expression of any half truth. In a case at law both the prosecuting attorney and counsel for the defense may be actively at pains to convince the jury by giving a color of truth to statements of this kind. Such a general policy may prove to be dangerous, however, for once successfully retorted, such assertions argue only a certain poverty of intellect on the part of him who stands back of them. A part of the cross-examination in Whistler's famous libel suit against Ruskin will serve to illustrate this point. The reader will observe that the Attorney-General is consistently given over to the policy of the literal statement of half truths and that Whistler as consistently exposes his purposes:

"Now, Mr. Whistler, can you tell how long it took you to knock off that nocturne?"

... "I beg your pardon?" (Laughter.)

"Oh! I am afraid that I am using a term that applies rather perhaps to my own work. I should have said, "How long did it take you to paint that picture?"

"Oh no! permit me, I am too greatly flattered to think that you apply to work of mine, any term

you are in the habit of using with reference to your own. Let us say then how long did it take to—'knock off,' I think that is it—to knock off that nocturne; well, as well as I remember, about a day."

"Only a day?"

"Well, I won't be quite positive; I may have still put a few more touches to it the next day if the painting were not dry. I had better say then, that I was two days at work on it."

"Oh, two days! The labor of two days, then, is that for which you ask two hunderd guineas!"

"No;—I ask it for the knowledge of a lifetime."

(Applause.)

"You have been told that your pictures exhibit some eccentricities?"

"Yes; often." (Laughter.)

"You send them to the galleries to incite the admiration of the public?"

"That would be such a vast absurdity on my part,

that I don't think I could." (Laughter.)

"You know that many critics entirely disagree with your views as to these pictures?"

"It would be beyond me to agree with the critics."

"You don't approve of criticism then?"

"I should not disapprove in any way of technical criticism by a man whose whole life is passed in the practice of the science which he criticizes; but for the opinion of a man whose life is not so passed

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I would have as little regard as you would, if he expressed an opinion on law."

"You expect to be criticized?"

"Yes; certainly. And I do not expect to be affected by it, until it becomes a case of this kind. It is not only when criticism is inimical that I object to it, but also when it is incompetent. I hold that none but an artist can be a competent critic."

LITERAL STATEMENT

The expression, "He calls a spade a spade," is employed to connote one whose habit of thought is literal, or, again, one whose frankness is coarse or rude. "Sire, I shall often displease you, but I shall never deceive you," said Dumouriez to Louis XVI. An illustration of the manner in which a discussion is effectually ended by taking an opponent at his word is contained in the following anecdote: Sydney Smith, the English divine, had won an argument, from an acquaintance. The latter said, "If I had a son who was idiot, I would make him a parson"; and Smith replied, "Your father was of a different opinion."

Matters which no one thinks of taking literally when so regarded may sometimes produce a surprising effect. The epigram of Nietzsche's: "It is a nice distinction, that God learned Greek, when he wished to turn author, and—that he learned it no

better," is not free of the possibility of ambiguous interpretation.

Hamlet, in order to escape the questionings of a too inquisitive interlocutor, constantly employs the device of replying literally:

Pol.—Do you know me, my lord?

Ham.—Excellent well, you are a fishmonger.

Pol.—Not I, my lord.

Ham.—Then I would you were so honest a man.

Pol.-.. What do you read, my lord?

Ham.—Words, words, words.

Pol.—What is the matter, my lord?

Ham .- Between who?

Pol.—I mean, the matter that you read, my lord?

Ham.—Slanders, sir: for the satirical rogue says here that old men have grey beards.

THE PRACTICAL MIND IS LITERAL

Romain Rolland in his unsurpassed arraignment of German acts and purposes at the time of the invasion of France exclaims in a dramatic passage: "Necessity knows no law. . . . Behold the eleventh commandment, the message you bring to the world to-day, Sons of Kant. . . . To be or not to be say you? Nay, 'tis not enough."

The faith of practical politicians in the creed of Realpolitik which is here denounced, as well as the

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worship of force generally and the accompanying contempt for ideas and ideals is, in effect, characteristic of the literal or practical mind. In violent contrast to such views is the superb optimism of Hegel as expressed in a passage from his *Philosophy of History:* "For, like the soul-conductor, Mercury, the idea is in truth the leader of peoples and of the world; and spirit, the rational and necessitated will of that conductor, is and has been the director of the events of the world's history."

AN EXAMPLE FROM THE TEACHING OF JESUS

The fundamental idea of the teaching of Jesus is the founding of the Kingdom of God. But in the mind of Jesus, or in the way in which he expressed the idea, the notion was ambiguous. Sometimes it means the reign of the poor and the disinherited; sometimes the literal accomplishment of the apocalyptic visions of Daniel; or again, the kingdom of souls and the deliverance of the spirit. Jesus himself was fully alive to the need of precision in a matter of such grave importance, and perhaps the most profound of all the reconciliations he attempted is contained in the saying:

"Neither shall they say, Lo here! or lo there! for behold the kingdom of God is within you."—Luke XVII, 20-21.

The kingdom of God is only to be found deep down in the heart of each one of us. The apocalyptic conception, that the actual order of humanity approaches its end, is on this interpretation a metaphor. The palingenesis, accompanied by agonies and calamities, is a rebirth of the spirit. The early Christian community, however, was preoccupied with the *literal sense* of these declarations of the Master. Only as time passed and the apocalyptic vision was not fulfilled, was the meaning of the prophecy given another sense.

AMBIGUITIES FROM QUESTIONS OF FACT

Sometimes the factors that conspire to produce an event are supposed to foreshadow an ambiguous result. This is the case when not all of the factors are known, so that the outcome is not precisely determined. It is notorious that a jury under such circumstances will condemn a man for a criminal act, whereas had more of the factors which controlled his behavior been known, the judgment might have been reversed. If the crime itself is an acknowledged fact and the criminal identified, the defense will be at pains to bring these unknown factors clearly to the light, preferring, when these are at hand, rational motives, like the defense of honor, family or life, or else compulsions in the man's environment that fairly lie beyond his own control.

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Here the interest in precision, in so far as it concerns the fact in question, lies in demonstrating that the matter could not well have turned out otherwise, or, at the worst, that the *prima facie* responsibility of the accused is more than what is actually the case.

Sometimes the essential factors which determine an event are not only unknown but in the nature of things unknowable. Again, many so-called indubitable facts that we seem bound to accept, are only true because they are matters of definition. The philosopher may argue that all men seek only their own interest, that all acts altruistic in appearance are only concealed cases of self-seeking; but care must be taken to see if this is only forced on us because of the way in which he defines his terms; to see if the cogency of his argument is more or no more than the cogency of tantologous statement. "Swaggering paradoxes, when examined," said Burke, "often sink into pitiful logomachies."

There is a direct connection between our knowledge of fact and the appearance of ambiguity in the meaning of terms. In a metaphorical sense facts themselves become ambiguous as their nature becomes better and better known. For a long time in the history of chemistry everything that was not a solid or a liquid was called "air." This term became more and more ambiguous as different "airs" came to be distinguished. If a candle is burned in

air under glass, the inert residuum possessing peculiar properties called for a special designation and was termed "nitrogen." At the very end of the century it was discovered that this term too was ambiguous, for it was proven that the inert residuum is not one chemical substance; that the new element argon is one of its constituents. Illustrations of this sort from the history of science might be greatly multiplied. The effort to hold consistently to the "molecular hypothesis" has led to subdivisions of the atom. The experiment of Michelson and Morley leading finally to the recent theory of relativity has introduced ambiguities into the meaning of mass, length and time.

CHAPTER VII

IN DEFENSE OF PREJUDICE

"For, of a truth, Love and strife were aforetime and shall be; nor ever, methinks, will boundless time be emptied of that pair.'

TOHANN HEINRICH LAMBERT in his Theory of Parallels published in 1786 after the death of the author, discovered the existence of a geometry many of whose characteristic propositions stand in contradiction to those of Euclid's own. Some of these paradoxical results possessed for his mind such a fascination in themselves that he would fain have held them to be true. In regard to one of these consequences he observed: "This result is so attractive that it easily creates the wish that the hypothesis on which it depends, might yet be But "these are argumenta ab amore et invidia ducta, which must be banished from geometry, as they must be banished from all other sciences." Had this eminent mathematician only had the courage to follow his instinct in this instance he would have been regarded as the discoverer of non-Euclidean geometry.

THE COLD COMFORT OF SCIENTIFIC INDIFFERENCE

This case illustrates pointedly the thesis of the present chapter, the thesis that the desire on the part of the scientist that something should be true, or, if you like, his prejudice in favor of a certain truth, facilitates its discovery. The great discoveries in science are very commonly the result of a certain bias on the part of the discoverer. Science has, through its technique, endeavored to impress upon the experimenter an indifference toward the outcome of his experiment. Regarding this so-called indifference of the objective observer, William James has this to say:

"For purposes of discovery such indifference is to be less highly recommended, and science would be far less advanced than she is if the passionate desires of individuals to get their own faiths confirmed had been kept out of the game. See, for example, the sagacity which Spencer and Weismann now display. On the other hand, if you want an absolute duffer in an investigation, you must, after all, take the man who has no interest whatever in its results: he is the warranted incapable, the positive fool. The most useful investigator, because the most sensitive observer, is always he whose eager interest in one side of the question is balanced by an equally keen nervousness lest he become deceived. Science has organized this ner-

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vousness into a regular technique, her so-called method of verification; and she has fallen so deeply in love with the method that one may even say she has ceased to care for truth by itself at all."

EMERSON'S PARADOX

Once during an address to one of Professor Child's classes at Harvard, Emerson made use of the occasion to voice a paradox. "Gentlemen," he said, "in twenty years the ranking list will be inverted." Many of those who are last will be first and those who rank high to-day will stand at the foot to-morrow. Emerson may well have been provoked to this remark by personal, though quite unconscious motives, for Professor Child had graduated with the highest honors, Emerson well down in the list of his classmates. The case of Emerson himself would most certainly bear out his generalization but a generalization based upon a single case would possess no inductive value at all.

Various are the ways that might be devised for trying out the truth of the Emersonian law. The obvious test would involve an appeal to statistical information. Psychological tests of how the mind grows might tend to show that those with greater potentialities develop at a slower rate, so that a college student who is mentally mature at twenty finds no difficulty in competition with a man whose

full powers have only begun to develop a decade later. The point to observe, however, is the fact that the law must be discovered before it can be tried out and that Emerson, who is desirous from personal motives that it be true, is more likely to discover it than Professor Child, who would naturally be set against it from the beginning. The desire that a certain thing should be true makes the finding out of that truth an easier matter. The prejudice against prejudice may be of value in human affairs, but, unreflectively considered, it may impede our human progress.

THE HUMAN VALUE OF PREJUDICE

The human value of passion, of prejudice, of love and hate, as opposed to the cold indifference which science advocates, the author has defended elsewhere (Open Court, August, 1921). In that connection he remarked: "Had the Babylonians not believed that the stars of heaven controlled the high matters of human destiny they would never have found the patience, century on century, to record their observations, and Hellenism, one of the few sporadic attempts of man to surpass man, that renaissance of the oriental world, would have inherited no science upon which to build. Modern Chemistry owes its advancement in no small part to the persistent effort of the alchemist to transmute

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the baser metals into gold, and the misguided attempts of the geometer to square the circle by the use of rule and compass has left its mark on the science and furnished the clue to the discovery of unsuspected truths. If the world in which we find ourselves provokes our curiosity, it is because we build it up in large part out of those aspects of reality that interest us. 'Nothing has been accomplished in the world,' says Hegel, 'without interest, and, if interest be called passion, we may affirm that nothing great has been brought about in the world without passion on the part of the actors.' But it is important to remark that the truth which beckons is not always the one finally verified, just as the benefit sought is rarely the one accepted in the end. The law of the conservation of energy followed on the search for perpetual motion, and more gold has flowed from the application of chemistry than the alchemist could well have dreamed. . . . The world of Dante with the earth at the centre of the universe and the seven heavens encircling it, with Jerusalem at the top and the mountain of Purgatory, displaced by Satan as he plunged downward from the Empyrean, at the bottom, was of course a normal conception for him. The astronomical crank of his day would be the man who espoused, as against this geocentric conception, the eccentric opinion that the universe is heliocentric at bottom, the evidence of our senses to the contrary notwithstanding. A man

who could express soberly such views might invent others equally absurd, and it was the custom of that day to put him quietly out of the way 'without the shedding of blood.' The majority of men has always insisted upon its inalienable right to deal as it sees fit with the 'abnormal' majority which strays too far from the norm."

THE HISTORIAN'S BIAS

Further in this same article "in defense of prejudice" the author had said: "The sphere, in which personal bias plays perhaps its most notably useful and important rôle, is the writing of history. The 'objective' historian, who opposes this view, we shall have with us always, like the rest of the poor in spirit; but his claims are readily exposed. According to this creature we must venture as little as may be beyond the 'documents' themselves. We must stand by the ipsissima verba at the risk of perverting the truth. If he sticks to his guns—he is par excellence the man who sticks to his dates—history is for him a colorless chronicle, whose only objective character is the 'facts' and their chronological order. His task would then be to establish this order 'without bias' and his history the documents set side by side. It is obvious from Euclid that his shelves, like the sentences of Kant, would have to be measured by a railroad engineer.

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"What he does, then, in practice is to foreshorten the picture; not, indeed, by abstractions, the 'most trenchant of epitomizers,' for that would be his personal medium operating to pervert the truth; but rather by leaving out of account the unimportant facts, the ones that have no bearing upon the drama in its larger outlines. But see you not, Sir Historiographer, that by this admission the whole humbug about objectivity and the impersonal narrative is exposed? You choose the facts. Very well, Sir, and how do you choose them and why? Because they illustrate some general point of view, which is your own. Because they illuminate some personal insight suggested by your own personal bias and interesting in so far as your imagination is daring, colorful, shrewd and—objective. In this sense history is more than romance and only the poet can be safely entrusted to write it. Alexandre Dumas pointed this out long ago but such seeds fall on stony ground. It was the novelist's own habit, when writing of an event, to construct, as the phrase goes, a priori, all of its parts down to the minutest detail. He surpassed all other men in the range and in the accuracy of his topographical imagination; and whenever he took the trouble to visit the scene of his historical dramas, which he did upon occasion, when the historical accounts contradicted his own, he invariably discovered that he was right and that the historian was wrong. The

search for objectivity, like the search for happiness, baffles all stupid folk, who know not how to forego the direct approach.

"If it be true that the historian selects those facts which illuminate his private point of view, it is no less true that the facts themselves are amenable to his interpretations. Facts to the unimaginative are hard and fast things; to the spiritually minded they are plastic. The mind of Plato is an historical fact. Who, then, was Plato? Was this mind best known to the author of the Dialogues? Beyond a doubt to Plato himself some aspects of it were pretty well revealed. But did he know it as it was really constituted? It is warranted that he possessed no such gift. I will wager that his illustrious pupil, Aristotle, knew its defects and its excellencies better than he knew them himself. Or was Plato the mind that was so well known to the scholars of the Renaissance? Each one of these points of view about the fact in question contains a measure of the truth, but none is absolute. Round about every historical fact there circles a halo of ambiguity and it is within the limits of this halo that the interpretation of the historian may have free range. The rim of fact is clear-cut only for him who has no magnifying lens at hand."

EXERCISES

- 1. Fox-glove is not the glove of the fox but (it may be) of the fays called folk—the little folk's glove. Ascertain the cause of the following misnomers: Cleopatra's needle, Pompey's pillar, rice paper, cuttle-bone, Prussian blue, lunar caustic.
- 2. Discover particular cases wherein the following principles seem to break down:

"Surely in vain is the net spread in the sight of any bird."

—Proverbs i, 17.

"When a woman aspires to learning there is commonly something wrong with her sex."

-Nietzsche, Beyond Good and Evil.

3. Seek a meaning of the terms that will make the following statements more than tautologous:

"Only the fittest survive,"

"Pleasurable states are those which one seeks to prolong; painful states those which one seeks to avoid."

4. Examine the statements below in order to discover if the sense may be changed by a change of accent:

"And he spake to his sons, saying, saddle me the ass. And they saddled him."

—I Kings, xiv, 27.

"Thou shalt not covet thy neighbor's house."

-Exodus, xx, 17.

"The cures effected at the tomb of François de Paris are the best authenticated of modern miracles."

-Paley.

5. Reconstruct the argument suggested by the following statement:

The opponents of Robespierre had declared in the Convention that he had been prone to identify his own enemies with those of the state. This he denied and he added: "And the proof is that you still live."

- 6. The will of Rabelais is said to have contained three articles: "I owe much, I have nothing, I leave the rest to the poor." Are these compatible or not?
- 7. Set forth clearly the ambiguity which the following quotation points:

"Antiquitas saeculi juventus mundi."

8. Examine the statement below and determine the sophism or paradox therein contained:

"Ponatur," quod Socrates dicat illam, "Plato dicit falsum," et Plato dicit illam, "Socrates dicit verum."

-Albertus de Saxonia.

9. What ambiguities are contained in the following:

"I do not love thee, Dr. Fell,
The reason why I cannot tell;
But this alone I know full well,
I do not love thee, Doctor Fell."

-Tom Brown.

10. What fact is most plausibly suggested by the following anecdote:

An English banker and poet had for a long time been aware that a certain lady possessed temperamental qualities much opposed to his own. Once she exclaimed at table: "Now, Sir, I know that you are talking about me again." "My dear lady," he replied, "I spend my life defending you from one calumny or another."

THE END

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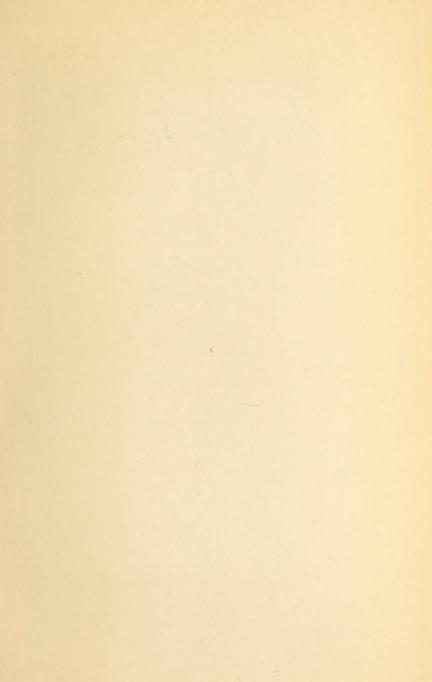
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